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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
 Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 March 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-21* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1, 2 and 4-21 have been examined.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action: .

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3.   Claims 1, 2, 4, 6-9 and 11-21 are rejected under 35 U.S.C. 102(a) as being anticipated by

Hartlieb et al. PCT WO02/057905 translation provided in U.S. Pub. No. 20040019802

(hereinafter Hartlieb).

4.   As per claim 1, Hartlieb discloses a method for securing a computer system which

comprises at least a code interpretation module and memory capacity for storing a interpreted

code having measurable physical imprints provided from said code interpretation module,

wherein in order to make more difficult attacks based on physical measurements or requiring

synchronization with said interpreted code (Hartlieb: [0007]), it consists of introducing at least

two types of alternatives in the execution time of the interpreted code, which have an effect on

the execution times of the interpreted code or on its measurable physical imprint, said

alternatives being introduced according to at least one of the following steps: a first step of

causing at certain places of an interpreted code bypasses towards new portions of code which do

not belong to the original code in order to complicate the synchronization and the physical

imprint of the execution (Hartlieb: [0017]: insert new code into original code), and/or a second

phase of proposing a plurality of implementations of certain instructions, each requiring a

different execution time and/or having a different physical imprint and providing an identical

result, so that two executions of one of said certain instructions within a same code may be

performed by two implementations (Hartlieb: [0019]: change the execution times of each

execution).

5.   As per claim 2, Hartlieb discloses the method of claim 1. Hartlieb further discloses

wherein the said first way in the execution times of the interpreted codes comprises a first mode

of introducing bypass codes including bypass instruction in certain particular locations of the

interpreted code, said introducing mode being made at each execution upon generating the

interpreted code by a code generator (Hartlieb: [0018]: the decoder generates and implants the

dummy code into the original commands).

6.   As per claim 4, Hartlieb discloses the method of claim 1. Hartlieb further discloses

wherein said step of causing bypasses comprises a first mode for introducing "bypass codes"

consisting of introducing one or more instructions specific to certain particular locations of the

code, either manually or automatically during the generation of the aforesaid code (Hartlieb:

[0017]: predefined or random locations of a program).

7.   As per claim 6, Hartlieb discloses the method of claim 1. Hartlieb further discloses

wherein the step of causing bypasses comprises a second mode for introducing "bypass codes"

consisting of introducing the bypass code in the implementation of the interpreter itself (Hartlieb: [0018]).

8.   As per claim 7, Hartlieb discloses the method of claim 6. Hartlieb further discloses wherein the bypass code introduced into the implementation of the interpreter is executed either systematically by the interpreter or selectively or randomly (Hartlieb: [0017]).

9.   As per claim 8, Hartlieb discloses the method of claim 1. Hartlieb further discloses wherein said step of causing bypasses comprises a first mode for realizing "bypass codes" consisting of performing a so-called "superfluous" calculation depending on data known at execution (Hartlieb: [0019]: dummy code sequence).

10.   As per claim 9, Hartlieb discloses the method of claim 1. Hartlieb further discloses wherein said step of causing bypasses comprises a second mode for realizing "bypass codes" consisting of providing the aforesaid first mode with a random draw of an extra datum during the execution of the superfluous calculation, said extra datum being used in the calculation performed by the bypass code (Hartlieb: [0016]).

11.   As per claim 11, Hartlieb discloses the method of claim 1. Hartlieb further discloses wherein said step of causing bypasses comprises a third mode for realizing "bypass codes" consisting of replacing in the aforesaid first and second modes the test for deciding on the next action by a branching in an indirection table containing the addresses of possible actions at an

index calculated from variable items (dynamical datum and/or result from a random draw)

(Hartlieb: [0018]).

12.   As per claim 12, Hartlieb discloses the method of claim 1. Hartlieb further discloses

wherein said step of causing bypasses comprises a fourth mode for realizing "bypass codes"

consisting of performing a superfluous calculation having the external characteristics of a

particular sensitive calculation (Hartlieb: [0019]: dummy calculations).

13.   As per claim 13, Hartlieb discloses the method of claim 1. Hartlieb further discloses a

first mode for introducing a plurality of implementations of certain instructions consisting of

enriching the set of instructions recognized by the interpreter with a plurality of implementations

for a given instruction (Hartlieb: [0017]); the aforesaid instructions are performed either

manually by programming or automatically upon code generation (Hartlieb: [0018]).

14.   As per claim 14, Hartlieb discloses the method of claim 1. Hartlieb further discloses a

second mode for introducing the aforesaid plurality of implementations of certain instructions

consisting of comprising in the actual implementation of the instruction, a branching to a portion

of at least one alternative code with a variable physical imprint or duration, which dynamically

determines the implementation to be executed (Harlieb: [0019]).

15.   As per claim 15, Hartlieb discloses the method of claim 14. Hartlieb further discloses a

first mode for realizing the aforesaid alternative code consisting of proposing a plurality of

different implementations of the instruction and by conditioning the choice of the executed

version to a dynamical test, i.e., depending on data known at execution (Hartlieb: [0019]).

16.   As per claim 16, Hartlieb discloses the method of claim 14. Hartlienb further discloses a

second mode for introducing the aforesaid plurality of implementations of certain instructions

consisting of comprising in the actual implementation of the instruction, a branching to a portion

of at least one alternative code with a variable physical imprint or duration, which dynamically

determines the implementation to be executed (Hartlieb: [0019]).

17.   As per claim 17, Hartlieb discloses the method of claim 14. Hartlieb further discloses a

third mode for realizing the aforesaid "alternative code" consisting of improving the aforesaid

first and second modes for realizing "alternative codes" consisting of replacing the test for

deciding on the selected version with a branching in an indirection table containing the addresses

of the available version at an index calculated for variable items (Hartlieb: [0018]: random

addresses).

18.   As per claim 18, Harlieb discloses the method of claim 1. Hartlieb further discloses being

implemented on a module for interpreting software code, a so-called virtual machine (Harlieb:

[0018]: decoder).

19.   As per claim 19, Harlieb discloses the method of claim 19. Hartlieb further discloses that

the decoder interprets the decode and the decoder includes but is not limited to virtual machine in

Java platform (Hartlieb: [0018]).

20.   As per claim 20, Hartlieb discloses the method of claim 1. Hartlieb further discloses the

method being implemented on a module for interpreting physical code (Hartlieb: [0016]).

21.   As per claim 21, Hartlieb discloses the method of claim 1. Hartlieb further discloses the

method being implemented on an embedded system and on an interpretation module of the

microcontroller or microprocessor type (Hartlieb: [0016]).

Claim Rejections - 35 USC § 103

22.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

23.   Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartlieb

in view of Collberg et al. U.S. Pat. No. 6668325 (hereinafter Collberg).

24.   As per claim 5, Hartlieb discloses the method of claim 4. Hartlieb does not explicitly

disclose wherein the bypass instructions are associated with security levels which correspond to

complexity levels of their bypass code, the most complex being considered as the most defensive

with regard to security attacks requiring synchronization with the code or measurement of its

physical imprint. However, Collberg discloses an obfuscation method that obfuscates program

code based on the security level desired (Collberg: column 2 lines 26-39). It would have been

obvious to one having ordinary skill in the art to obfuscate code based on the security measures

because both prior art discloses obfuscating techniques. Therefore, it would have been obvious to

one having ordinary skill in the art at the time of applicant's invention to combine the teachings

of Collberg within the system of Hartlieb because it makes sure that frequently executed parts of

the application are not obfuscated by very expensive transformations to maintain efficiency

(Collberg: column10 lines 62-64).

25.   As per claim 10, Hartlieb discloses the method of claim 8. Hartlieb does not explicitly

disclose wherein the aforesaid first mode for realizing "bypass codes" is improved by attaching

different security levels to the implementations of instructions and associating them with all the

more complex implementations. However, Collberg discloses an obfuscation method that

obfuscates program code based on the security level desired (Collberg: column 2 lines 26-39). It

would have been obvious to one having ordinary skill in the art to obfuscate code based on the

security measures because both prior art discloses obfuscating techniques. Therefore, it would

have been obvious to one having ordinary skill in the art at the time of applicant's invention to

combine the teachings of Collberg within the system of Hartlieb because it makes sure that

frequently executed parts of the application are not obfuscated by very expensive transformations

to maintain efficiency (Collberg: column10 lines 62-64).

Response to Arguments

26.   Applicant's arguments with respect to claims 1, 2 and 3-21 have been considered but are

moot in view of the new ground(s) of rejection.

Conclusion

27.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Shin-Hon Chen whose telephone number is (571) 272-3789. The

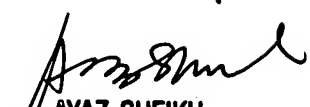examiner can normally be reached on Monday through Friday 8:30am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shin-Hon Chen
Examiner
Art Unit 2131

SC

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